

11/29/2022

Team 503: Hardware In Loop 1tenth Scale Automobile

Kathleen M. Bodden; Richard Allen; Micah J. Hilliard; Nicholas L. Muoio; David
Gordon; Chet Iwuagwu

FAMU-FSU College of Engineering 2525 Pottsdamer St. Tallahassee, FL. 32310

Project Review

The objective of this project is to design a vehicle that can be controlled remotely and autonomously to navigate an urban environment. Team 503 aims to optimize the design by minimizing inertial forces during propulsion and integrating with a concealed tracking device.

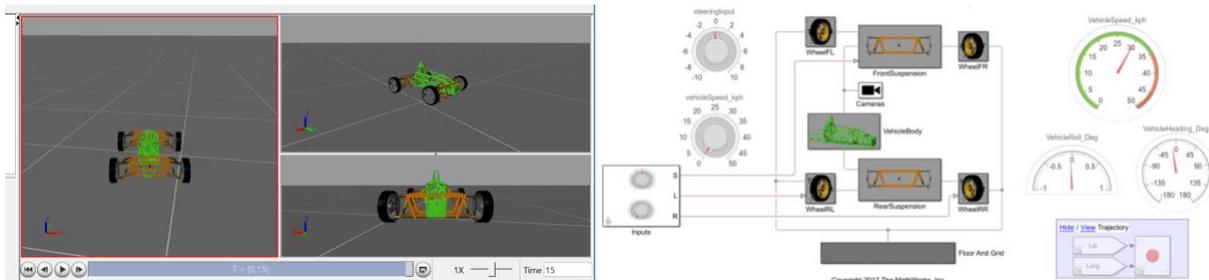
Mechanical Prototype

Work on the mechanical prototype started by prototyping a Steering Wheel Actuator for a Nissan Rogue 2016. The design will be scaled down with some slight changes once we have the Radio Flyer Tesla Model S for kids.



Simulations

We used MATLAB to simulate a car in a 3D environment. The current simulation prescribes a sinusoidal sweep to the vehicle to demonstrate a slalom path.



Problem Areas

Team 503

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1. Prescribing a path to simulations – One way we might go about this is by integrating our original Genta model into the new model downloaded from MATLAB.
2. Gear ratio on steering actuator – We will measure the dimensions when we receive our vehicle and then we will be able to find the proper gear ratio for the steering system found in the vehicle as it will differ from the one on the Nissan Rogue.
3. Gear-steering wheel connection – This problem will occur after we test our current design on the new vehicle. By taking new dimensions and redesigning the clips, we should be able to fix this problem
4. Integration between T503 & T504 designs – We will go about avoiding this problem by working closely with team 504 throughout the entire design process

Future Work

The first task of team 503 is developing a spring project plan to try and organize our timeline for the upcoming semester. Then, we will investigate the solutions proposed above. We will also finalize our bill of materials by the end of the winter break before the next semester begins. This will allow us to order materials with longer lead times, to hopefully have a finished mechanical design by mid-February. We are in the process of reaching out to Dr. Yunyi Jia at the Collaborative Robotics and Automation (CRA) Lab for guidance into his research on autonomous vehicles.